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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,972	08/22/2003	Robert Aharonov	MAI-14602/16	8385
25006	7590	06/21/2006	EXAMINER	
GIFFORD, KRASS, GROH, SPRINKLE & CITKOWSKI, P.C			IVEY, ELIZABETH D	
PO BOX 7021			ART UNIT	
TROY, MI 48007-7021			PAPER NUMBER	

1775

DATE MAILED: 06/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/645,972	Applicant(s) AHARONOV ET AL.	
	Examiner Elizabeth Ivey	Art Unit 1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2006.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-9,12-14,21 and 22 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1,5-9,12-14,21 and 22 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu (US 6,482,476). Liu teaches a layer (coating) comprising CrN on a substrate such as a pin (column 18 line 64-19 line 6). Regarding the article claims with method limitations, [E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.", (In re Thorpe, 227 USPQ 964,966). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product (In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 6, 7, 8 and 21, are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,213,075 to Ajayi et al. in view of U.S. Patent 6,640,779 B1 to Thiagarajan.

Regarding claims 1, 6, 7, 8 and 21, Ajayi teaches parts of a combustion engine, particularly a pin, coated with CrN via CVD or PVD to reduce friction and wear during operation (abstract, column 1 lines 10-16 and 44-48 and column 2 lines 41-46). Although the pin of Ajayi is not a piston pin, Thiagarajan teaches a piston pin is a load bearing part of an engine for which improved lubrication or reduced friction and diminution of wear is sought. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have applied the CrN coating of Ajayi to a piston pin to relieve the load bearing part of friction and wear as is done for the pin of Ajayi. Regarding the article claims with method limitations, [E]ven though product-by-process claims are limited by and defined by the process,

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determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.", (In re Thorpe, 227 USPQ 964,966). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product (In re Mamsi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113). Ajayi teaches the coating may be CrN, Cr₂N, TiN, DLC and mixtures thereof (doped). Although the references do not disclose a plurality of layers, mere duplication of parts (layers) has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,213,075 to Ajayi et al. and U.S. Patent 6,640,779 B1 to Thiyagarajan as applied to claim 1 further in view of U.S. Patent 2,558,286 to Albertson.

Regarding claim 5, Ajayi and Thiyagarajan teach all of the limitations of claim 1 but do not expressly teach the coated pin to be polished. Albertson teaches polishing of frictional bearing surfaces such as engine components to improve surface finish, and wear resistance. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to polish the coating on the component surface to further improve surface finish and wear resistance.

Claims 9, 13, 14, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,213,075 to Ajayi et al. in view of U.S. Patent 6,640,779 B1 to Thiyagarajan and U.S. Patent 4,974,497 to Lemelson.

Regarding claims 9, 13, 14 and 22, Ajayi teaches parts of a combustion engine, particularly a pin, coated with CrN via CVD or PVD to reduce friction and wear during operation (abstract, column 1 lines 10-16 and 44-48 and column 2 lines 41-46). Although the pin of Ajayi is not a piston pin, Thiyagarajan teaches a piston pin is a load bearing part of an engine for which improved lubrication or reduced friction and diminution of wear is sought. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have applied the CrN coating of Ajayi to a piston pin to relieve the load bearing part of friction and wear as is done for the pin of Ajayi. Regarding the article claims with method limitations, [E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.", (In re Thorpe, 227 USPQ 964,966). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the

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claimed product and the prior art product (In re Mamsi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113). Ajayi teaches the coating may be CrN, Cr₂N, TiN, DLC and mixtures thereof (doped). Although the references do not disclose a plurality of layers, mere duplication of parts (layers) has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). Although Ayaji and Thiyagarajan do not teach an assembly of a piston, a connecting rod and a piston pin, Lemelson teaches an assembly of a piston connected to a connecting rod by means of a piston pin and discusses wear resistance of engine parts (figure 1 and column 2 lines 8-12). Therefore it would have been obvious to use the coated parts of Ayaji and Thiyagarajan in an assembly such as Lemelsons to improve the wear resistance and friction of the piston pin and because it is a known and common assembly of engine parts. Ajayi teaches the coating may be CrN, Cr₂N, TiN, DLC and mixtures thereof (doped). Although the references do not disclose a plurality of layers, mere duplication of parts (layers) has no patentable significance unless a new and unexpected result is produced. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over by U.S. Patent 6,213,075 to Ajayi et al., U.S. Patent 6,640,779 B1 to Thiyagarajan and U.S. Patent 4,974,497 to Lemelson as applied to claim 9 further in view of U.S. Patent 2,558,286 to Albertson.

Regarding claim 12, Ajayi, Thiyagarajan and Lemelson teach all of the limitations of claim 9 but do not expressly teach the coated pin to be polished. Albertson teaches polishing of frictional bearing surfaces such as engine components to improve surface finish, and wear resistance. Therefore, it would have been obvious to a person having ordinary skill in the art at

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the time of the invention to polish the coating on the component surface to further improve surface finish and wear resistance.

Claims 1, 6, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al (US 5,582,414) in view of Ajayi et al (US 6,213,075).

Regarding claims 1, 6, 7 and 8, Miyazaki teaches coating a piston component with a first layer of CrN and a hard coating of oxygen and CrN (plural layers). Miyazaki does not specifically teach application of this coating to a piston pin and does not teach deposition via vapor processes. Ajayi teaches an internal combustion engine having components such as the pin coated with a hard coating of CrN and deposited via vapor deposition or other conventional method known in the art. As it is taught by Ajayi that other components benefit from coating with CrN, and that the deposition is successfully performed with vapor deposition, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the coatings of Miyazaki to a pin or other piston components which is a sliding surface via vapor deposition, as the coatings of Miyazaki provided improved sliding characteristics and superior durability. Regarding the method limitations, [E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the

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product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.", (In re Thorpe, 227 USPQ 964,966). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product (In re Mamsi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,582,414 to Miyazaki et al in view of U.S. Patent 6,213,075 to Ayaji et al. further in view of U.S. Patent 2,558,286 to Albertson.

Regarding claim 5, Miyazaki and Ayaji teach all of the limitations of claim 1 and Ayaji teaches the need for a low friction surface and improved wear resistance, but does not expressly teach the coated pin to be polished. Albertson teaches polishing of frictional bearing surfaces such as engine components to improve surface finish, and wear resistance. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to polish the coating on the component surface to further improve surface finish and wear resistance.

Claims 9, 13, 14 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,582,414 to Miyazaki et al in view of U.S. Patent 6,213,075 to Ayaji et al. in view of U.S. Patent 4,974,497 to Lemelson.

Regarding claims 9, 13, 14, Miyazaki teaches coating a piston component with a first layer of CrN and a hard coating of oxygen and CrN (plural layers). Miyazaki does not specifically teach application of this coating to a piston pin and does not teach deposition via vapor processes. Ajayi teaches an internal combustion engine having components such as the pin coated with a hard coating of CrN and deposited via vapor deposition or other conventional method known in the art. As it is taught by Ajayi that other components benefit from coating with CrN, and that the deposition is successfully performed with vapor deposition, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the coatings of Miyazaki to a pin or other piston components which is a sliding surface via vapor deposition, as the coatings of Miyazaki provided improved sliding characteristics and superior durability. Regarding the method limitations, [E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.", (In re Thorpe, 227 USPQ 964,966). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product (In re Mamsi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983), MPEP 2113). Although Miyazaki and Ajayi do not teach an assembly of a piston, a connecting rod and a piston pin, Lamelson teaches an assembly of a piston connected to a connecting rod by means of a piston pin and discusses wear resistance of

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engine parts (figure 1 and column 2 lines 8-12). Therefore it would have been obvious to use the coated parts of Miyazaki and Ayaji in an assembly such as Lemelsons to improve the wear resistance and friction of the piston pin and because it is a known and common assembly of engine parts.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,582,414 to Miyazaki et al, U.S. Patent 6,213,075 to Ayaji et al. and U.S. Patent 4,974,497 to Lemelson as applied to claim 9 further in view of U.S. Patent 2,558,286 to Albertson.

Regarding claim 12, Miyazaki, Ayaji and Lemelson teach all of the limitations of claim 9 and Ayaji teaches the need for a low friction surface and improved wear resistance, but do not expressly teach the coated pin to be polished. Albertson teaches polishing of frictional bearing surfaces such as engine components to improve surface finish, and wear resistance. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to polish the coating on the component surface to further improve surface finish and wear resistance.

Response to Arguments

Examiner acknowledges applicant's amendment to claims 1 and 9 and cancellation of claims 2-4, 10-11 and 15-20 and addition of claims 21-22. Accordingly, examiner withdraws 112 rejection of claim 9 and rejections of claims 2-4, 10-11 and 15-20.

Applicant's arguments with respect to claims 1, 5-9, 12-14 and 21-22 have been considered but are moot in view of the new ground(s) of rejection.

Regarding applicant's argument that Liu does not teach a CrN coating, in fact Liu does teach a nitrided layer on the substrate (coating) comprising CrN as claimed as indicated above.

Regarding applicant's argument that Ajayi's axel pin and a piston pin are significantly different, examiner submits that both pins are used in a combustion engine, both pins carry a load and both benefit from decreased friction and increased wear resistance and examiner holds it is obvious to coat a piston pin as indicated above.

Examiner withdraws rejection to Mmaejima (JP 08028346).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

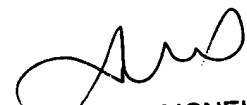
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Ivey whose telephone number is (571) 272-8432. The examiner can normally be reached on 7:00- 4:30 M-Th and 7:00-3:30 alt. Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Elizabeth D. Ivey


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6/15/06